

Preoperative Placement Of Umbilical Artery Catheter For Use During Umbilical Sparing Gastroschisis Repair

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Citation

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Abstract

We report the case of a term infant with gastroschisis who underwent an umbilical sparing repair. Because of the inability to obtain peripheral arterial access, we placed and used an umbilical artery catheter. The operation was successful and there were no complications from the catheter. To our knowledge this is the first report of using the catheter in the native umbilicus.

CASE REPORT

A 3 kg term infant with a gastroschisis was delivered by Cesarean section. The exposed bowel was wrapped with saline soaked gauze and placed in a plastic bag. The baby was given 40 cc/kg bolus of Plasmalyte A via a peripheral intravenous catheter. In the operating room, after induction of anesthesia, a urinary drainage catheter and a second IV line was placed. Arterial catheter placement in the radial artery was attempted, but failed. Instead, a 3.5 French catheter was placed into the umbilical artery via the umbilical cord. The catheter was prepped in the surgical field and the infant underwent an umbilical sparing primary closure of the abdominal wall defect. There were no complications related to the umbilical artery catheter.

DISCUSSION

Managing the fluid problems associated with gastroschisis can be a significant challenge. Some babies may require as much as 50 to 100 milliliters of fluid per kilogram per hour, and can develop a severe metabolic acidosis. Before surgery, vascular access may be difficult because of dehydration secondary to third space losses. In addition, the infant may develop significant hypotension when the intestinal contents are replaced back into the abdomen. Having intra-arterial monitoring during this time can be critical, and provide caretakers with early evidence of poor perfusion. Bladder pressure or intragastric monitoring following primary closure and can be used to estimate intra-abdominal pressure but may be difficult to transduce ^{1,2}.

Gastroschisis requires surgical repair shortly after birth. This is by primary closure of the abdominal wall defect or silo

placement ^{3,4,5}. In the past it has been common to excise the umbilicus. Umbilical excision was performed to reduce a perceived increased risk of infection. If arterial access was required, and could not be obtained by percutaneous placement, the umbilical artery could be translocated to the lower abdominal wall ⁶.

Recently, there has been a trend to spare the umbilicus ^{7,8,9,10}. An advantage of leaving the umbilicus is that it leaves a potential site for vascular access. Umbilical artery or venous catheters can be placed prior to commencing surgery. The catheters are prepped in the sterile field and do not interfere with the surgical procedure. This allows the catheter to be used before, during and after the operation.

We are unaware of any previous publications describing the use of umbilical artery catheters with the umbilicus left in situ in infants with gastroschisis. In view of the readily accessible umbilicus, and the difficulty in central vein and peripheral artery catheterization in such infants, the use of the umbilical vessels provides ready access for initial stabilization of such infants. Thus if an umbilicus sparing gastroschisis repair is to be performed, one may consider placing a catheter in the umbilical artery, the umbilical vein or both for monitoring and blood sampling purposes.

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